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JULY—AUGUST 1991

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THE
Hampden Hippocrat
JULY–AUGUST 1991

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Our cover photo shows a CT scan being performed at Holyoke Hospital which is located in Holyoke Massachusetts

The official bulletin for The Hampden District of the Massachusetts Medical Society. Founded in 1942 by Edward P. Bagg, Jr., M.D. and William A. R. Chapin, M.D.

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From the Editors

In this issue, the Hippocrat highlights the practice of radiology in the Pioneer Valley. At Baystate, where radiologists have begun to subspecialize, several have assisted in summarizing the latest developments in their own areas. Dr. Said Z'ubi updates us in Nuclear Medicine. Dr. Mark Bean writes of new techniques in Interventional Radiology. Dr. Fred Hampf has written on advances in the area of Ultrasound. Dr. Richard Hicks discusses M.R.I.

Our Hippocrat Interview is with Dr. Max Cloud regarding the current social and political climate in which radiologists have to practice. Dr. Howard Raymond and Dr. Murray Watnick have also contributed to this issue. We thank all of them for their help in putting this issue together.

Our cover shows technologist Stacy Carruthers performing a CT scan at Holyoke Hospital; the photo is the courtesy of the hospital's Public Relations Department.

To the relief of the readers, we have not published the cartoon of the cat looking through a magnifying glass at a bewildered patient, with the words "CAT SCAN" printed beneath it. Our journal is above such frivolty. ■

The Editors

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Letter from President of HCBA

The enclosed request from the President of the Hampden County Bar Association is being published in the hopes that physicians in other counties as well as Hampden, might have an interest in working on a tribunal. If you have an interest, please call Hampden District Medical Society at 736-7301 and we will forward your name to Mr. Fitzgerald.

Dr. Joseph Keenan
75 Springfield Road
Westfield, Massachusetts 01085

Re: Medical Malpractice Tribunals

Dear Joe:

You may be aware of the fact that considerable delays exist in the Hampden County Superior Court (HCSC) regarding the convening of the Judge-Doctor-Lawyer tribunals concerned with medical malpractice cases. There are many cases wherein over a year has passed without a hearing before such tribunal. As you probably know, the applicable statute specifies a tribunal hearing twenty (20) days after the filing of an Answer on behalf of the relevant defendant.

The foregoing problem was called to my attention by one of the lawyers in the Hampden County Bar Association (HCBA) who has several cases wherein he is defending doctors from various specialties. Since a case cannot proceed to trial without having been subjected to the tribunal hearing, cases are stagnating.

The doctors who are defendants therein have complained to their counsel about the failure of the system to move the case for trial. They would prefer to dispose of a case within a reasonable time frame in order that their anxiety level might be decreased, and that insurance considerations might not be of concern to them.

I am informed that the delay in convening tribunals is a result of the decreases in staff and funding at the HCSC. It has been suggested that, perhaps, our respective organizations might be of help in resolving the issues being confronted by doctors and lawyers because of the delays in effecting the tribunal process.

One of the reasons for such delays is that personnel at the HCSC Clerk's Office are not available to make the inquiries and contacts inherent in obtaining a doctor to sit on a tribunal, who is a specialist in the field of the subject defendant. The law requires that such doctor be from other than Hampden County.

It has occurred to us that the Hampden County Medical Society (HCMS) might be of help in identifying such specialists, and prevailing upon them to sit on such tribunals. A condition precedent to the process would be the necessity that the parties to the case agree upon the identity of the doctor and lawyer who would sit on the tribunal. The Clerk's Office would then be informed thereof, and the formality of appointing the tribunal would be performed by the Clerk's Office.

Would you kindly consider the foregoing and favor me with your comments. It might be a worthwhile opportunity whereby the relationships between the HCMS and HCBA, and the members thereof, might be improved.

Thank you for your consideration of the above. ■

Best regards,
William M. Fitzgerald

Lots of Angry Doctors!

During my college days at Dartmouth, when I was truly educated, I was sports editor of the daily newspaper. I took great advantage of my office and wrote ad nauseum about my personal feelings about whatever seemed wrong with the NCAA, Ivy League, ECAC, etc. Despite the fact that I've totally lost the ability to write about anything that couldn't be described in a S-O-A-P format, I have been looking forward to having an open shot once again, though this time obviously with an eye on a system of a different kind.

Mark J. Mullan, M.D., President

That was until today. The day before the deadline for publication. I had already written an opinion piece on a variety of issues, including the PRO and Medicare reimbursement, when I stumbled across the feature piece from JAMA (June 5, 1991) entitled, "Arnold Relman—The Last Angry Doctor."

Over the several year period that I have been deeply involved in HDMS activity, Dr. Relman's diatribes in the New England Journal of Medicine have more often than not raised the hackles of a large number of local physicians. Though recognizing the need for some editorial freedom in NEJM, many of us have felt that he abused his editorial privilege by espousing certain beliefs which were clearly not in tune with and poorly representative of the people he should at least make some attempt to represent—Massachusetts Medical Society members.

However in this interview, even allowing for the author's own prioritization of issues, Dr. Relman has gone overboard as he essentially characterizes the major problem with the American health care system as being the methods of physician reimbursement which encourage the "self interests of medical entrepreneurialism". In other words, we make too much money and if we don't change the error of our ways our professional integrity will be lost and the rest of the health care system will suffer the consequences. He goes on to state that he hopes he will be able in "a year or so" to synthesize his experience and ideas to formulate a solution to the system's current problem. This from the man who has made well into six figures for the past decade or so and has existed solely in the sterile environment of a journal which flourishes on its own sense of self-importance.

Practically speaking, he needs about three minutes to synthesize his editorial experiences which bear any relevance to the present health care system. He didn't practice clinical medicine during the decade of the greatest explosion of medical technology and knowledge in history. He hasn't spent a Sunday afternoon in the record room spending four hours responding to a PRO reviewer's criticisms, most of which would have been muted if proper chart review was performed. But then again we're doctors so that family time isn't important.

Dr. Relman hasn't dealt with a medicaid bureaucracy which witholds payments whenever they can. Nor has he had to worry about caring

for patients of a myriad number of HMO/IPA/PPO organizations, each insurer having a different set of rules, regulations and reimbursement policies. He hasn't dealth with the patients who have fallen through the cracks in the health care system who are frightened to tears, not about their underlying medical condition, but about their fears of burdening their families with the cost of the care they may someday require.

I could go on for pages with similar thoughts. And though Dr. Relman feels that it is "ridiculous" for anyone to think he doesn't know what is going on in today's medicine, I respectfully disagree. The fact that people like Dr. Relman have an M.D. after their name doesn't make their opinions relative to any reality in the system any better than those of the nonphysician entrepreneurs he so haughtily scorns.

Physicians do need to be intimately involved in the urgent, ongoing deliberations relative to the changes needed to be made in the system so that the system becomes more responsive to the needs of our patients. But it is the practicing physician who has a much better understanding of the shortcomings of the present system and who can more clearly clarify those benefits which are needed to ensure good health for all. And though we are not a homogeneous group, it is imperative that we be heard before any cataclysmal changes are made in the current system of delivery of care.

One of the major reasons a busy practitioner like myself has taken the time to become involved in organized medicine is because I want to be sure that the physician input the public and the politicians hear is not only that of those who pretend to know the answers and will even crucify their colleagues in an attempt to further their own views and ambitions.

I guess it would be fair to say that Dr. Relman is not the "last angry doctor". There are still lots of us left. ■

Approved by The Hampden District Medical Society

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Feature

Radiology For The People

A Basic Radiological System For Developing Nations

Murray Watnick is a radiologist at the Noble Hospital. The following article describes his work as an advisor to the Pan American Health Organization in their efforts to bring basic radiology to the developing world. A community hospital physician was particularly sought as an advisor because it was felt that the special expertise of that type of radiologist was needed.

In the final decade of the twentieth century, highly developed technology has become commonplace and is accepted without reservation as being progressive and essential to modern life. This fact has become most apparent in the field of medicine with C.T., M.R.I. SPECT, PET and others becoming rather routine in the diagnostic armanentarium. The specialty of Radiology (Diagnostic Imaging) had led the way in developing these highly sophisticated modalities. Unfortunately, for the greater part of the world's population, these incredible technological break-throughs have virtually no meaning. For approximately four billion people or about 80% of the world's population, there is little or no access to the simplest procedures such as a chest or extremity x-ray. If an x-ray machine is available, the patient may have to travel by foot for several days to reach the city where the machine is located. There are usually long waiting lists at these centers for the simplest procedure, causing significant delay in diagnosis and treatment. Often the available equipment is not functioning due to lack of spare parts and breakdown of inappropriately donated equipment. At any point in time up to 60% of the x-ray machines may not be operating due to these and other factors and another 20% may be operating suboptimally. Other reasons for this sad state of affairs include limited health care budgets, war time conditions including embargoes, little or no trained personnel, fluctuating electrical power sources, unfavorable climatic conditions, and oppressive non-caring health systems. Above all, the basic problem may be inappropriate technology for developing nations. What may be perfectly appropriate for our medical needs in the U.S.A. may be completely inappropriate in a developing country. Furthermore, the cost of a single M.R.I. scanner could wipe out the entire health care budget of a small developing nation. After all, most useful diagnostic x-ray examinations are relatively simple. Very sophisticated machines are not required for the vast majority of medical problems in the developing world. Obviously, the basic diagnostic needs of most of humanity are not being satisfied by the current arrangement.

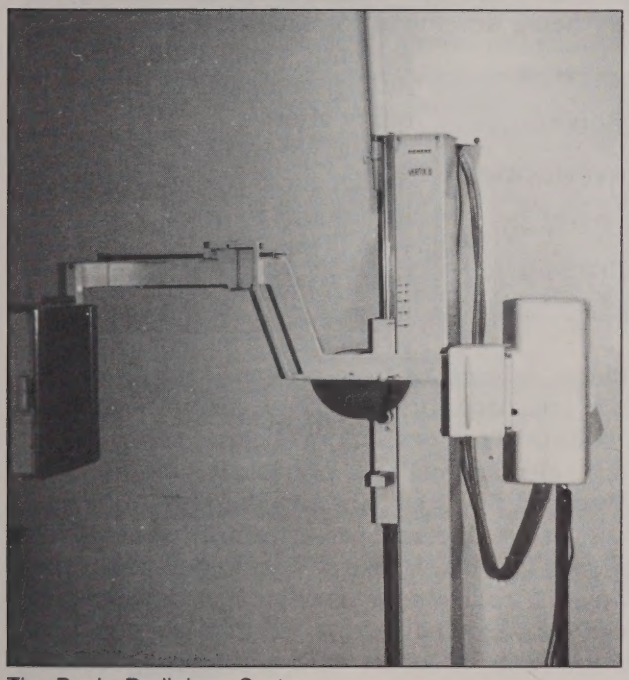
"Can we afford to ignore the situation... where more and more sophisticated equipment is being made available to fewer and fewer people?"

Despite this gloomy picture there is a ray of hope. During several trips to Central America I had the opportunity of learning first hand about this problem and a possible solution. While serving as a member of a medical delegation and as an advisor to the Pan American Health Organization in Radiology, I helped promote the basic radiographic system (BRS), as proposed by the World Health Organization. My experience was gained at hospitals in Masaya, Nicaragua and San Jose and Heredia in Costa Rica. The system was first proposed by an advisory group to the World Health Organization in the mid 1970's after careful analysis of the problem. The group decided that for the most part nonoperating, nonadaptable donated equipment by well meaning

individuals looking for tax credits was not needed. Expensive "high tech" equipment located in large centers in large cities will not satisfy the basic diagnostic needs of the great majority of the population. Properly designed equipment should meet the following criteria:

1. Scientifically valid.
2. Adapted to real needs (mainly infection and trauma).
3. Acceptable to population serviced.
4. Affordable, simple utilization and maintenance.
5. Acceptable to health care providers.
6. Must comply with international standards.
7. No compromise with image quality.

After long consultation with engineers, physicists, radiologists, technologists, and administrators, the World Health Organization decided on



The Basic Radiology System

an acceptable design. The machine was to be relatively inexpensive in price and maintenance. The machine will be simple to operate with a brief training period of approximately 8 days for the operator. It should be able to function under extreme climatic conditions and cope with large power fluctuations, operating off a battery or a main—connected rectifier with a storage capacitor. There should be easy installation, usually needing one day, with simple maintenance and repair. The techniques must be standardized with repeats seldom needed. In essence, an "instamatic camera" approach was required. The machine was to be stationary, producing plain films only, with no fluoroscopy. Though the approach is essentially low tech, the design specifications would be relatively high tech, but inexpensive. Radiation exposure had to be within acceptable limits. Three manuals were to be published on technique, darkroom processing and interpretation. The last manual is controversial in that nonradiologists are to be trained in simple interpretation. The paucity of trained diagnostic radiologists in developing countries necessitates this decision.

After observing the use of the system in Nicaragua and Costa Rica, I am firmly convinced of the great applicability of the design. The equipment appears to perform well and easily satisfies the requirements of the original design. Over the past 15 years, approximately 500 units have been installed all over the world. Unfortunately, at last count there are only 25 to 30 units installed in the Western Hemisphere. Why the BRS system has not been more widely used in our hemisphere is open to conjecture. The BRS system may be too good and therefore threatening to long cherished beliefs. Radiologist and technologists trained in relatively affluent North America and Europe may perceive the BRS as being "low tech" in a "high tech" world and, therefore, of limited application. Fear of loss of control by specialists may exist. The last BRS sold for about $90,000, when the original projected cost 7 to 8 years ago was $24,000. This is obviously due to a very limited demand. Obviously the impetus for demand must spring from highly motivated radiologists and primary care physicians. Currently no North American company is producing the BRS. The large corporations may hesitate to mass market a low cost machine at the expense of the high ticket items. Low technology may mean relatively low profit. However, the potential is incredible with one machine able to serve between 50 to 100 thousand people. Dr. Philip Palmer at the University of California who has worked extensively with the BRS in Africa estimates that the global market potential stands at 70 thousand machines. Can we afford to ignore the situation in the world where more and more sophisticated equipment is being made available to fewer and fewer people? A more equitable distribution of diagnostic services could prove to be a major advance for world health. Of course, this must be looked at in the context of financial constraints and great need for adequate nutrition, potable water, shelter, immunizations, pre-natal care, and antibiotics for the world's population. The World Health Organization must be commended for directing research on the basic radiographic system as part of its goal of "health for all in the year 2000".■

Interventional Radiology

Mark Bean, M.D., is an interventional radiologist in the Department of Radiology at Baystate Medical Center. He contributed the following article on this rapidly changing specialty.

During the past ten years there have been significant changes to the special procedures subspecialty of Radiology. These changes have been facilitated by improvements of imaging including C-arm fluoroscopy, CT, and ultrasound scanning. With these modalities, we have gained a much better understanding of the pathophysiology and anatomic manifestations of disease which has in turn allowed advances in the subspecialty that we now call Interventional Radiology. Along with these advances of imaging has occurred the parallel development of catheters, needles, guidewires, and other equipment that permit us to tackle cases not possible ten years ago.

Formerly a diagnostic specialty, Interventional Radiology is now increasingly therapeutic.

The changes that led to Interventional Radiology can be explained best by dividing the specialty into vascular and non-vascular applications. Ten years ago "special procedures" was primarily vascular radiology: we served as diagnosticians, obtaining vascular studies frequently prior to surgery. Now if a stenosis of the arterial or venous system is detected we may safely and effectively dilate these stenoses using a catheter with attached balloon in a procedure called angioplasty. Complete occlusion of venous or arterial vessels noted on angiogram seven years ago would have precluded any further radiologic workup. Thrombolytic therapy is now used to dissolve clot with a high success rate often revealing an underlying critical stenosis which may then be treated by balloon angioplasty. These procedures do not exclude future surgery and frequently can be performed earlier than surgery would be contemplated. Treatment of vascular grafts may actually extend the life of the graft or define the area that needs surgical repair. For cases where the vessel resists the balloon angioplasty, fine gauge wire stents are being employed to hold the vessel open. These stents are used primarily in larger vessels although techniques are being developed for smaller vessels and are currently being studied by cardiologists for use in the coronary arteries.

New advances in catheter design allow the Interventional Radiologist to select very distal vessels that have not previously been accessible. Embolic material may be injected safely to occlude bleeding vessels in ulcers, tumors, or from trauma. This superselective approach for delivery of chemotherapy and ablation of tumors is more effective and safer than less selective methods previously employed. Venacava filters are now small and have been designed to be placed percutaneously without much more time or risk than venography. Small thrombogenic coils placed through specially designed catheters may be used to treat varicoceles as an outpatient procedure with minimum morbidity.

Non-vascular intervention developed when vascular techniques were applied to non-vascular structures. For example, strictures of the esophagus, bile ducts, or other parts of the GI tract or GU tract can be safely dilated using the angioplasty balloon. Small catheters and guidewires, employed to selectively study the fallopian tube, have increased the accuracy of hysterosalpingography. It is also possible to use small angioplasty balloons to relieve strictures of the fallopian tube and therefore treat infertility. Obstruction of the kidneys or biliary system can be diagnosed and bypassed with special catheters designed for prolonged use. Through the same access site, wire or plastic stents may

be placed to obviate the need for external drainage.

Other non-vascular procedures have been developed because of advances of imaging and needle design. Abscesses, fluid collections and masses (suspected tumors) are accessible with utlrafine needles which can be placed safely and redirected as necessary. The exact location of the needle is confirmed by CT or Ultrasound. Accurate biopsies and safe approaches to drainage with larger catheters are possible as a result. These techniques are applicable to almost any anatomic location including the brain, neck, thorax, abdomen, or extremities.

Interventional Radiology has had a profound effect on patient care. Ten years ago most of our exams were performed on inpatients. Now, most vascular procedures and many other interventional procedures are done as a Daystay. More diseases are treated with less invasive procedures with less morbidity. The development of Interventional Radiology has created changes in the working relationships between the Radiologist and surgeons and interventionalists of other fields. The Interventional Radiologist now frequently works directly with the endoscopist from Urology or Gastroenterology to provide access for procedures such as stent placement or stone removal that would have been difficult or impossible if attempted independently. This working relationship which has developed between the interventional Radiologist and other physicians cannot help but improve patient care. ■

AnneSofie Dubeck, M.D.
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Diagnostic Medical Ultrasound Imaging

Frederick E. Hampf, Jr., M.D., who contributed the following, is Chief of the Ultrasound Section in the Department of Radiology at Baystate Medical Center.

Definition and History:

The human ear perceives sound frequencies in a range of 20 to 20,000 Hz (cycles per second) and sound is described as ultrasound if its frequency is above the audible range. In medicine, the useful frequencies are in the range of 2-10 MHz (megahertz).

Ultrasound continues to be one of the most cost-effective diagnostic imaging technologies.

Ultrasound pictures are produced by probes or transducers that emit short pulses of high frequency sound at rapid intervals. The probe in between pulses is switched to "listen" to the pattern of returning echoes from the tissues of the body. The transducer is in the receiving or listening mode more than 99% of the time.

Over the past decade, the technology of ultrasound has gone through and continues to experience many rapid changes. As recently as eight to ten years ago, many institutions used equipment that could produce only one picture or "tomographic slice" of tissue echogenicity per movement of the probe. This was called "static" imaging as the image was photographed and then erased before the next one could be produced. Because of improved computer technology, current instrumentation produces over sixteen individual images per second, such that to the eye, images are seen continuously or in "real-time".

Doppler ultrasound (a nonimaging technique) applies the principle of differences in sound frequency between transmitted and reflected sound to measure the velocity of a moving target, usually red blood cells. Duplex Doppler utrasound or a duplex scanner is equipment combining real-time imaging with Doppler assessment of blood flow. Most recently, color flow imaging or mapping has been added to the sonographers' armamentarium. This technology extracts velocity information from the returning echoes of the entire image and adds that information to the two dimensional image as color. The color and intensity respectively represent the direction and magnitude of all velocities throughout the entire image simultaneously.

Advantages and Disadvantages:

The advantages of ultrasound technology are numerous. Examinations are relatively cheap, and are quick to perform for many indications. Much of the equipment is portable and is therefore frequently the first and only diagnostic imaging for critically ill patients throughout the hospital other than plain radiographs. The technology allows an infinite number of orientation planes of imaging. Evaluation of anatomy and physiology is therefore not confined by the standard transverse, coronal, and sagittal planes of other imaging modalities. The real-time capability of ultrasound imaging allows physiologic observations and diagnosis. Ultrasound imaging, particularly with its ability to observe anatomy in an infinite number of planes, can be used as a rapid interventional guidance technique whenever bone and/or air do not intervene between the probe and the target. Finally, the technology uses no ionizing radiation and therefore is the modality of choice for imaging

in obstetrics and pediatrics. It can be used for many diagnostic screening procedures and can be used readily for follow-up examinations of known pathology for evaluation of response to therapy.

The disadvantages to the technology are that intervening bone, air, and high density substances such as barium can produce marked attenuation of sound and make it impossible to image targets deep to them. Because depth of penetration is inversely proportional to image resolving power, patient obesity can limit or prevent imaging of deep structures. Finally, extreme pain on the part of the patient may also limit the ability to palpate or probe with the ultrasound transducer during the procedure.

Uses:

Ultrasound is used by radiologists literally from head to food in medical diagnostic imaging.

In the head, ultrasound in neonates is the screening procedure for diagnosis of intracranial hemorrhage, hydrocephalus, and for many congenital anomalies. In adults, transcranial Doppler can follow vascular spasm in order to appropriately time intervention in cases of leaking or ruptured intracranial aneurysms.

In the neck, Doppler ultrasound, now with color flow, evaluates the extracraneal vasculature, lymph nodes, retropharyngeal abscesses, and masses involving thyroid and/or parathyroid glands.

Breast ultrasound differentiates cysts from solid masses and guides ultrasound aspiration of cysts and now is used in guidance of fine needle aspiration biopsies of nonpalpable solid lesions.

Within the thorax, pleural masses/fluid can be differentiated and drained or biopsied. Any mass or x-ray density abutting the chest wall can be evaluated with ultrasound.

Echocardiography is actually two entirely separate subspecialties, pediatric and adult. The entire spectrum of congenital and acquired heart disease can be evaluated both structurally and physiologically, particularly now with the addition of color flow Doppler. While the radiologist is usually not the primary sonographer in cardiac disease, any radiologist performing obstetrical ultrasound must have extensive knowledge of cardiac anatomy and physiology in the fetus and neonate, and any radiologist performing abdominal ultrasound should be aware that many upper abdominal signs and symptoms are related to intrathoracic, particularly cardiac abnormalities.

In the abdomen, all organs can be evaluated for size and structure as well as for their blood flow. Diaphragmatic motion, intestinal motion, and even primary intestinal pathology such as appendicitis, intussusception, or meconium ileus in patients with cystic-fibrosis can be diagnosed. Masses and fluid collections can be located and biopsied or drained.

Pelvis ultrasonography includes but is not limited to obstetrical and gynecological patients. Obstetrical ultrasound evaluates the entire maternal pelvis, including gravid uterus and placenta. The embryo/fetus can be evaluated for structure and possible anomalies, size and growth, and physiologic well being. The fetus can be aided in its intrauterine life by recent ultrasound guided interventional techniques usually performed by subspecialist in the field of perinatology. The entire field of reproductive medicine/infertility management has been revolutionized by ultrasound both transabdominally and now particularly by transvaginal ultrasonography. Transvaginal ultrasonography is

Continued on next page

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Ultrasound Imaging

Continued from previous page

also the modality of choice for ectopic pregnancy workup and in the evaluation of embryonic and early fetal viability. Also included in pelvic ultrasonography are examinations performed utilizing endorectal probes. Endorectal ultrasonography can stage rectal carcinoma and guide transrectal biopsies of perirectal lymph nodes. Although not yet a screening tool, endorectal probes have also revolutionized the diagnosis and management of prostatic carcinoma. The workup of hematospermia and male infertility has been enhanced by transrectal prostatic ultrasound.

Transplant imaging in the abdomen and pelvis (liver, pancreas, kidney) has become dominated by duplex Doppler ultrasound and its performance has been made quicker by the addition of color flow mapping.

In the extremities, duplex Doppler ultrasound aids in the evaluation of arterial flow, follows patency of shunts and grafts, and checks possible graft anastomotic complications. In venous studies, ultrasound will probably soon totally replace contrast venography for the diagnosis of deep venous thrombophlebitis, saving morbidity and the rare mortality from contrast reactions.

In pediatrics, ultrasound is the most widely used modality after plain films. It has in fact become a screening technique for: 1) intracranial hemorrhage and hydrocephalus in neonates; 2) evaluating vomiting infants for possible hypertrophic pyloric stenosis; 3) in the evaluation of questioned congenital hip dislocation and/or acetabular dysplasia in the neonate and young infant; and 4) evaluating the spinal cord and thecal sack in neonates born with sacral hair tufts or sacral dimples.

Finally, even in musculoskeletal imaging, where MRI has justly become the primary diagnostic modality after plane films, ultrasound can contribute to quick, reproducible, cost effective diagnosis. Joint effusions can be diagnosed. Foreign bodies can be located. Masses in muscles can be characterized. Tendon tears can be diagnosed.

Future Directions:

Future uses of ultrasound include expanded use of intercavitary/intraluminal probes, expanded applications of color flow mappings throughout the body, and new technologies such as ultrasound contrast agents and computer analyses of frequencies to develop tissue characterizations for signatures of both benign and malignant pathologies.

The intracavitary/intraluminal advances include G.I. endoscopic ultrasound for evaluating depth of invasion of esophageal and gastric carcinoma and the transgastric/transdnoderal evaluation of small pancreatic tumors. Uses in the colon are on the horizon. Endovascular probes exist now and characterization of plaques in peripheral arteries can be accomplished but utility is not yet generally agreed upon. Transvaginal color flow Doppler sonographic evaluations of ovaries in patients at high risk for ovarian carcinoma is present now but its efficacy and cost effectiveness are currently being debated in the literature.

Finally, the early development of 3D ultrasound is appearing in the literature and may become commercially available within the next five years.

Ultrasound continues to be one of the most cost effective diagnostic imaging technologies in the radiologists' armamentarium. It is used from head to food in medical imaging and development of its future uses seems to be limited only by our imagination. ■

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Magnetic Resonance Imaging— An Evolving Technology

Richard Hicks, M.D., the Director of Magnetic Resonance Imaging of Baystate Medical Center, brings us up to date in this evolving area.

Magnetic resonance imaging began in Western Massachusetts in 1987, initially with a mobile scanner at Mercy Hospital and a fixed site at Baystate Medical Center. Additional mobile scanners have since been added to the region and the number of cases performed has steadily grown, with studies being done seven days a week and up to 20 hours per day. However, it is felt by many that the area remains underserviced with the need for additional imaging capacity.

Magnetic resonance imaging had proven its utility in the head by 1987, but imaging of the body, extremities and heart was at that time just beginning to move from the research domain into the clinical arena. Imaging of the spine showed great promise, but its exact role with respect to CT and myelography was yet to be established.

A number of technical improvements since that time have dramatically increased the quality of MRI examinations. The development of surface coils designed for specific anatomic regions has resulted in higher resolution images of the spine, extremities and temporomandibular joints. More flexible imaging parameters allow shorter examination times. Cardiac gating and motion suppression sequences yield higher quality images of the brain, spine, and chest. Gradient echo

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Magnetic Resonance Imaging

Continued from previous page

imaging allows more possibilities for contrast manipulation and shorter exam times. The introduction of an MRI contrast agent, gadolinium, has greatly improved imaging of primary and metastatic tumors of the brain and has led to MRI largely supplanting CT and angiography in the evaluation of these lesions.

These developments over the past 4 years have expanded the role of MRI in clinical imaging. It is currently the imaging procedure of choice for virtually all studies of the brain with the exception of acute trauma, suspected subarachnoid hemorrhage and hemorrhagic stroke. MRI has very definite advantages over CT in the imaging of pituitary adenomas, acoustic neurinomas, and developmental disorders. Early on it became evident that MRI was an excellent modality for imaging metastatic disease to the spine due to its high sensitivity to marrow involvement and ability to image epidural tumor and cord compression. It has now also become the initial study (after plain films) for the evaluation of cervical radiculopathy and myelopathy. The utility of MRI and CT in the lumbar spine is similar but MRI has the advantage of better differentiation of epidural scarring and disc herniation in the postoperative spine.

The use of magnetic resonance imaging in the musculaskeletal system has exploded in the past several years; initial studies were largely of the knee and hip, and while these studies have continued to increase in number, imaging of the temporomandibular joints, ankle, shoulder, and wrist has blossomed. The usefulness of MRI lies in its ability to image menisci, hyaline cartilage, bone (including osteonecrosis and occult fractures), tendons, and ligaments.

Abdominal MRI continues to be problematic due to the lack of an oral contrast agent and motion artifact. Despite these limitations it is often useful in evaluating liver, retroperitoneal, and pelvic lesions and is particularly helpful in the pediatric abdomen where a paucity of fat often limits the differentiation of tissues by CT. Studies of the chest have improved and MRI is a useful second-line modality for mediastinal lesions and aortic abnormalities. Where cine-MRI capabilities are available it has become a valuable technique in cardiac imaging.

Magnetic resonance imaging remains an evolving technology and many exciting developments are expected to further augment its capabilities in the very near future. Faster scanning will be possible with echo-planar techniques for T2-weighted imaging and turbo-FLASH for T1-weighted imaging. The T2 sequence, usually the longest part of any exam, may be reduced by a factor of up to 16 times from the current 8-15 minutes. This will result in the ability to perform T2-weighted images during a single breath-hold. More powerful computers will reduce exam time by speeding data manipulation.

Three-dimensional imaging techniques will become more routine as the acquisition times are cut to 6-10 minutes, enabling contiguous slices as thin as 11 mm, multiplanar reconstructions, and surface reconstructions. This technique has a proven role in musculoskeletal imaging and is expected to enhance spinal imaging as well as surgical and radiation therapy planning.

Magnetic resonance angiography will continue to improve and when combined with 3-D imaging techniques it becomes a useful adjunct in the imaging of arteriovenous malformation, aneurysm, dissection, and cerebral venous sinus thrombosis. Difficulty in imaging turbulant flow associated with stenoses remains a problem to be solved.

Phased-array coils will allow high resolution surface coil images with larger fields of view encompassing the abdomen, pelvis or chest which currently require lower resolution body coil images. These coils will permit imaging of the entire spine in a high resolution sagittal image.

In-vivo magnetic resonance spectroscopy is the focus of much research activity and may yet become a clinically useful technique with high-field strength magnets.

Magnetic resonance imaging has revolutionized imaging of the central nervous system and with further development promises to do the same for imaging of the body, extremities and vascular system. ■

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Nuclear Medicine

Said Z'ubi, M.D., who is Chief of the Nuclear Medicine Section in the Department of Radiology at Baystate Medical Center, wrote the following article.

Nuclear Medicine from its conception, relied on physiochemical principles for the functional studies of targeted organs. In the early years only crude images were produced by a scanner on xray film, mapping the distribution of the radioisotope. In the last 10 years there have been major strides in the instrumental and radiopharmaceutical fields.

"...interfacing the computer with the gamma camera has made functional studies a true reality."

The main imaging device in nuclear medicine is the gamma camera that detects and displays the distribution of the tracer in a given organ. The basic concept of the gamma camera is still the same, but there have been significant improvements including a larger field of view and a higher count detection with excellent resolution. The most significant innovation is the SPECT (Single Photon Emission Tomography) gamma camera interfaced to a dedicated nuclear medicine computer, creating cross sectional maps of the radiotracer distribution. In addition, the interfacing of the computer with the gamma camera has made functional studies a true reality.

Paralleling the advancement in instrumentation have been significant advances in the radiopharmaceutical field, the main beneficiary being cardiac studies.

In the field of cardiology, the gated cardiac studies are the most accurate for the noninvasive evaluation of the ventricular ejection fractiona nd wall-motion abnormality. Thallium imaging following stress or after the administration of persantine is a noninvasive method for the diagnosis of coronary artery disease and also to evaluate the significance of coronary artery stenosis. The shunt study is a simple procedure for accurately measuring left-to-right cardiac shunt. The new techniciun-nitrile based radiotracer was approved recently by the FDA for the perfusion imaging of the myocardium.

New in gastroenterology is the use of the dual isotope method for the study of the rate of gastric emptying of both solids and liquids simultaneously. The modified in-vivo tagging of red blood cells for lower GI bleed proved

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Nuclear Medicine

Continued from previous page

extremely sensitive and helpful in guiding angiographic and/or surgical procedures. The HIDA hepatobiliary studies are highly accurate in the study of the hepatobiliary system and specifically for the diagnosis of acute cholecystitis and acute biliary tract obstruction. The SPECT method using radiolabelled red blood cells is the preferred method for differentiating hemangiomas from other focal lesions of the liver.

Technician MAG3, a new renal agent, is used to evaluate renal flow and tubular function, replacing the hipparan I 131, where only crude images here acquired. Renal studies with ACE Inhibitors are very useful in differentiating correctable renal artery stenosis from other causes of hypertension.

Last, but not least, is the advancement in radio-pharmaceutical chemistry that crosses the blood brain barrier and produces functional images of the brain by the SPECT method. This is hand-me-down chemistry from PET (Positron Emission Tomography) research. The SPECT brain perfusion imaging is helpful in the early diagnosis of acute infarction, before the changes are detected on the CT or MRI. It also is useful in differentiating Alzheimer's dementia from multiple infarct dementia and, in addition, is being used to localize epileptic foci to guide therapeutic procedures.

At the present time PET technology is very expensive and can run in the millions of dollars; it will be confined to research centers for the foreseeable future. The clinical work will be carried out by the SPECT method as more chemistry is learned from PET research in fields of neurology, psychiatry and cardiology.

Another very promising technology that will play a role in the future of nuclear medicine is the use of monoclonal antibodies tagged to isotopes fro the detection and treatment of cancer.■

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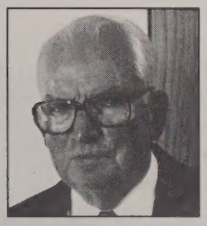
John W. Turner, M.D.



In the recent passing of Dr. John W. Turner, a former president of the Hampden District Medical Society (1970-71), the medical community lost one of its most erudite, creative, and congenial colleagues. He had practiced the specialty of Radiology in this area since 1938, fashioning a career replete with honors... locally, nationally and internationally... and demonstrating standards of excellence that inspired respect and emulation among his peers.

A native of Smithfield, Texas, John was educted at Baylor University, elected to Alpha Omega Alpha Honorary Medical Society. His postgraduate training included a rotating internship at Parkland Hospital, Dallas, Texas, followed by a Fellowship in Radiology at the University of Michigan (1937-38). In 1938, he became a Diplomate of the American Board of Radiology, and migrated to Massachusetts, presumably for one year. Fortunately for this community, that became a 53-year expedition in excellence.

World War II interrupted Dr. Turner's private career, and he became the Chief of Radiology at the AAF Navigation School, San Marcos, Texas, and the Chief of Radiology and Regional Consultant, Tucson, Arizona (1942-46).

After the war years, John Turner returned to the Springfield area to become, at various stages, Radiologist at Western Massachusetts Hospital (1938-1957); Chief of Radiology, Wesson Memorial Hospital (1951-1977); Associate Professor of Nuclear Medicine, University of Connecticut (1978-1982); Chief of Medical Imaging, Wesson Memorial Unit, Baystate Medical Center (1977-1981), and Clinical Professor of Radiology, Springfield Technical Community College (1974-1991), Co-Chairman, Department of Radiology, Baystate Medical Center (1977), and Chairman Emeritus, Department of Radiology, Baystate Medical Center (1981-Present).

Throughout his career, John was a dedicated student of his specialty and maintained a constant awareness of the expanding parameters of its scope. This led to his developing the first Nuclear Medicine facility in Western Massachusetts in 1953 at the Wesson Memorial Hospital, resulting in his endorsement by the American College of Radiology as a Diplomate in Nuclear Medicine. Later, he was to become a Diplomate of the American Board of Nuclear Medicine in 1972. He received Fellowship Honors in the American College of Radiology in 1946 and the American College of Nuclear Medicine in 1974.

Dr. Turner's interest and involvement in cancer detection and treatment are chronicled in his long association with the American Cancer Society as a director of the Massachusetts Division from 1961 to 1991, as well as serving as President in 1977-78. His awareness of advancing

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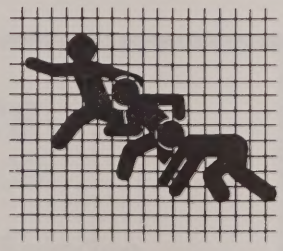

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John W. Turner, M.D.

Continued from previous page

technology in radiotherapeutic modalities led to the installation of the first Cobalt unit in this area at the 130 Maple Street office in 1957. In recognition of his outstanding contribution to the control of cancer, he was awarded a bronze medal by the American Cancer Society in 1970. Beyond his efforts in the diagnosis and treatment of lung cancer and other respiratory diseases related to smoking, his personal crusade to eliminate the hazards of tobacco usage gained him worldwide recognition.

As an academician, Dr. Turner's devotion to teaching was unflagging and gave him much satisfaction. In addition to his lectures at Springfield Technical Community College and on the hospital scene, John especially enjoyed the one-on-one tutoring experiences with medical students for months at a time... often during their vacation periods. Over the years, the records of the students under his tutelage taking their National Board examinations were most creditable and, on several occasions, registering the top grades in the country. His teaching sessions continued after his retirement from practice.

Dr. John Turner is survived by his wife, Oma, to whom he was married for almost 54 years, and by his son, John G. Turner, who is the father of one daughter and three sons. Of special delight to John and Oma was the arrival of a great grandson during the past year.

Dr. Turner's reputation as an academician and clinician was enhanced by the delicately dry sense of humor that blended well with his kindness, compassion, and patience. And, in his untimely passing, the Boston Red Sox lost a loyal and optimistic fan. ■

Kenneth L. McEwen, M.D.

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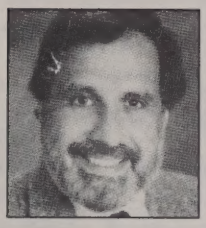
SilverPlatter Isn't Just for Librarians Anymore- A Radiologist's Perspective



Dr. Howard Raymond recently published the following article in ***The SilverPlatter Exchange****. This publication is a newsletter for users of a database for abstracts of the literature. Howard Raymond is a former chief of Radiology and currently Vice President of the medical staff at Holyoke Hospital. He is also co-editor of the national academic journal* ***Seminars in Ultrasound****. Why does a community hospital physician do all this? "Posterity has nothing to do with it; I want to feel I'm not repeating myself."*

Holyoke Hospital is a 250 bed acute care facility located in the foothills of Western Massachusetts. Its sole mission is to provide medical care to the inhabitants of the City of Holyoke and the surrounding communities.

The full gamut of modern radiologic and nuclear medicine services (approximately 65,000 exams per year) are provided by five physicians—a nuclear medicine specialist and four radiologists including myself.

In our small cluster of offices, books and journals are packed into bookcases on every wall. In addition to two decades worth of textbooks, we subscribe to eight key journals with issues going back as far as 1970. Many issues are unbound and a few volumes are lost. This mountain of information has more or less kept up with the explosive growth of radiology. But just try to find what you need when you need it.

Help has finally arrived and it looks like a compact disc. When I first became acquainted with the SilverPlatter Radiology & Nuclear Medicine CD, I assumed it would be a very useful tool for academic departments involved in teaching and research. But could it help untangle the information pile in a typical nonacademic, clinical practice like my own?

I anticipated the SilverPlatter CD would provide lists of references much like the guide to radiologic literature published annually by ***Radiology***. I knew SilverPlatter would be more complete because it provides 10 years of data. ***Radiology*** only provides three. Furthermore, SilverPlatter is updated quarterly while ***Radiology*** is yearly. I even suspected that SilverPlatter would be easier and quicker to use then the printed guide. And of course, I knew SilverPlatter would always be available right on my desk, as compared to ***Radiology*** which is always difficult to locate.

Continued on next page

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A Radiologist's Perspective

Continued from previous page

The value of SilverPlatter as a reference guide is illustrated by the following incident. An ENT (ear, nose, and throat) specialist had a patient in the emergency department with food impacted in his distal esophagus. The tube going to this patient's stomach was completely blocked. He was unable to eat or drink.

Traditionally, these patients were treated by endoscopy, placing a tube with a scope down the esophagus and physically removing the offending material. The ENT physician had heard of a new technique whereby the patient is given a gas producing contrast agent used in CT in conjunction with an injection of glucagon, a substance that causes relaxation of the esophagus and other parts of the gastrointestional tract. Follwing such a regimen, the impacted food will often pass into the stomach and the need for more invasive treatment such as endoscopy is obviated.

We needed to know specifically how this new procedure is performed. I had seen the article in a recent issue of one of the major journals, but which one? The printed guide wouldn't help because the article in question is too recent. I would have had to look through all the unbound issues of recent journals. Instead, I consulted SilverPlatter.

After keying in the three search terms, "esophagus," "food," and "impaction," the article in question was located instantly. Unfortunately, it is a work in progress and is not abstracted. But I was able to find the original article much more quickly than I would have if I didn't have SilverPlatter.

The patient received the new, non-invasive treatment and responded quite well.

This instance is just one of the many times that SilverPlatter has really helped me. Having found it to be such a useful tool in the clinical setting, I am hoping to convince the hospital and the medical staff to obtain subscriptions to other specialty databases and put them on the hospital's computer network. Why not make this tool available to everyone on the staff? After all, having spent just two months with the system, I am convinced of its clinical value. Could I live without it now? Not happily. ■

H.D.M.S. First annual "Smoke-Free Class of 2000" Poster Contest Grand Prize Winner Nicole Vann of Springfield's Memorial School with Karin Mueller of Marion Merrell Dow, Inc. and H.D.M.S. President, Dr. Mark J. Mullan.

H.D.M.S. SMOKE-FREE CLASS OF 2000 POSTER CONTEST GREAT SUCCESS

The Hampden District Medical Society, in support of the Springfield School's Third Grade "Smoke-Free Class of 2000" program, sponsored a poster contest in the schools to promote community awareness of the project. The contest drew entries from all 22 schools bringing the total number of entries to 1800. Runner-up winning entries were on exhibit for ten days at Baystate West Shops where a judging was held on June 3.

On June 11, at Springfield City Hall, Mayor Mary Hurley, Springfield School Superintendent Dr. Peter J. Negroni, and H.D.M.S. President Mark J. Mullan, M.D. presented awards of $50 Savings Bonds to 21 First Place Winners and a $200 Savings Bond to the Grand Prize Winner. All students who participated in the contest received a McDonald's Gift Certificate and all runner-up winners received a one-day pass to Riverside Park in Agawam.

Hampden District gives special thanks to Marion Merrell Dow, Inc., The McDonald Corporation, Riverside Park, Baystate West, The Springfield School Department, The American Lung Association of Western Massachusetts, The H.D.M.S. Women's Auxiliary, The American Heart Assocation, The Cancer Society, The Springfield Newspapers, Springfield Outdoor Advertising, WWLP-TV and the Massachusetts Career Development Institute.

From the MMS Regional Office

The Massachusetts Medical Society, in cooperation with the American Medical Association and the Connecticut State Medical Society is pleased to announce, **Interactions: A Medical Staff Leadership Program**, scheduled for October 18-19, 1991, at the Boston Waltham Vista Hotel, Waltham, MA.

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- **Marie G. Kuffner, M.D.,** *Associate Professor of Anesthesia, UCLA School of Medicine*
- **William G. Lavelle, M.D.,** *Professor and Chairman, Otolaryngology—Head and Neck Surgery, Department of Surgery, University of Massachusetts Medical Center*
- **William Smith, J.D.,** *American Medical Association, Office of General Counsel*

Plan to join your colleagues from Connecticut and Massachusetts on October 18 and 19 for this one of a kind program. For additional information, please contact Yael Miller, MMS Department of Health Care Systems and Policy Analysis, 1-800/522-3112, or the MMS West Central Regional Office. TO REGISTER, please call the American Medical Association, 1-800/621-8333. Conference discounts are available if more than two medical staff members from the same hospital attend. Ask for details. ■

Kerin L. Milesky
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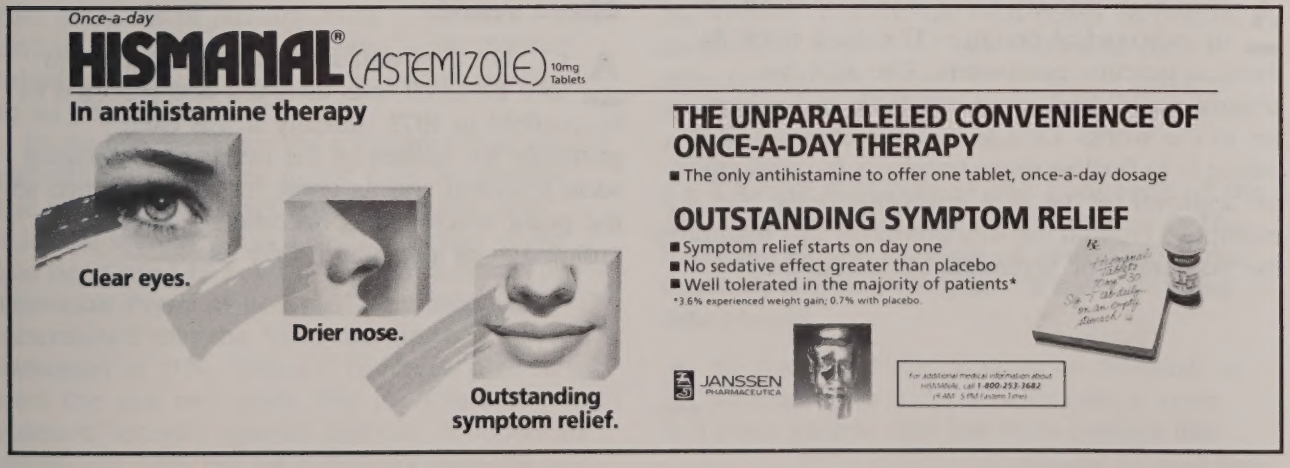
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Max Cloud:

Thinking Locally and Nationally About Radiology

Max Cloud became active in organized radiology activities in 1981 when he began serving on the executive committee of the Massachusetts Radiological Society. He was later president in 1988. At the national level, he is one of fifteen members of the Steering Committee of the American College of Radiology (ACR) and has been a Councilor from Massachusetts to the College since 1987.

Max graduated from Northwestern University Medical School in 1959 and then completed his graduate training in Radiology at Letterman General Hospital in San Francisco in 1963. He has practiced radiology in Springfield since 1967. He is currently president of his group, Radiology and Imaging, and Director of Mammography at Baystate Medical Center.

Q What issues have a high priority with the American College of Radiology at this time?

A One high priority issue is that of standards of radiological practice. The AMA refers to them as practice parameters. The ACR has already established some standards and others are in the works. One task of the Steering Committee is to finalize these standards in preparation for approval by the ACR governing body. For example, I chaired the subcommittee that finalized the Standards for Screening Mammography which was passed last year. Among other things, it includes qualification of the interpreting physician and technologists, CME requirements, minimum number of mammograms a radiologist should be reading per year to maintain competency, and which views should be obtained. Other recently adopted standards are in ultrasound, interventional radiology, and radiation oncology.

Q What stands out as the most important aspect of all this work right now?

A All of the standards are important, but if I had to pick one it would be Communications. When adopted, probably later this year, it will define how and how soon the examination results should be communicated to the referring M.D. For example, if an unsuspected lung mass is seen on a preoperative chest film, it is not enough to simple send the written report—the report should be telephoned to the referring M.D.

Q What do you think has been the biggest change in radiology in the past fifteen years?

A CT. The first unit arrived in Springfield in July 1976. CT was invented and reported by Hounsfield in 1973. Initially it was used primarily for studies of the head. Body imaging soon followed and its usage has mushroomed to the point where it has become a basic tool of radiology—as a standard x-ray exam.

Q How are radiologists learning to use these new techniques, first CT and now MRI?

A Radiologists attend instructional courses and read the literature. They also learn from younger radiologists who join them in practice and have been trained in MRI during their residencies. Thats how it was for CT and that's how it's being done for MRI. It was a pretty big jump from plain films to CT. Now we are used to cross sectional imaging so it's not as big a jump to MRI. Radiologists have already learned to think three dimensionally.

Q Have you been involved in efforts by organized radiology to oppose reductions in reimbursements to radiologists?

A Very much so. When Medicare was passed in 1965 the original intent was to keep hospital based physicians out of the reimbursement system for Medicare reimbursement to physicians. The ACR fought that effectively at that time. In 1986, in the Reagan administration, it surfaced again. There was a major move to make radiologists, pathologists, and anesthesiologists part of the hospital reimbursement, or DRG. The ACR's response to that was to propose to Congress that radiology develop its own radiology relative value scale on which reimbursement would be based. Congress accepted this and this is how radiology has been paid for the past two years. As of January 1992, it would be folded into the Hsaio relative value scale (RBRVS), which will be the basis for medicare payment to all physicians.

In the last two years the specialties that involve procedures have seen major cuts. Meanwhile the primary care physicians have seen only minimal increases, because the money saved has been used to pay the federal deficit. The Physician Payment Review Commission has determined that the "overvaluedness' of radiology is 21%. That cut has been phased in over the past two years. The fee schedule released recently ignores that cut. It shows an additional 32% cut for radiology over the next four years. We feel that this is a violation of the intent and the letter of the law. The ACR is going to oppose this vigorously when the proposal comes before Congress.

Q How do you think this will all play itself out?

A Well, the fees that were announced for the new Medicare RBRVS Fee Schedule are approaching Medicaid levels and it may happen that non-hospital based physicians in some specialties will consider eliminating Medicare patients from their practices.

Another threat to radiology is that in the 1980's the government focused on controlling hospital costs. The focus in the 1990's will be on high cost technology. As a result we are going to have to come up with better technology assessment. Before we just looked at clinical effectiveness and safety when a new piece of equipment came along. Now cost effectiveness is going to be right up front.

Patient being positioned for MRI in the mobile MRI unit at Holyoke Hospital. Photograph courtesy of Holyoke Hospital. Dr. Cloud feels MRI may replace CT in five years.

Q I know that one of the concerns of the American College of Radiology is the increase in the amount of radiology practiced by nonradiologists. What's driving this trend?

A As a result of the pressure on hospitals to contain costs and live with DRG's more and more patient care has been pushed into

Continued on next page

Interview Max Cloud

Continued from previous page

the nonhospital outpatient setting. As a result, hospitals, physicians, including radiologists, and private entrepreneurs are developing imaging centers. Now about one-third of the diagnostic imaging done in the United States in the nonhospital setting is done by radiologists. That was true before the proliferation of ultrasound, CT, and MRI, but now many more high cost procedures are being done. I am told that in some areas of Florida and California there are almost as many imaging centers as there are fast food restaurants. This trend seemed to fit in with the Reagan administration promotion of so-called competitiveness in medicine.

Q But don't insurance companies refuse to pay for these services?

A No. There are no standards in the nonhospital setting for insurance companies to go by in determining whether or not to pay for a diagnostic imaging study. Any physician, regardless of his or her training, can perform, interpret, and bill for these procedures in this setting.

To have a successful imaging center you have to have patients and that's where you get into the business of self-referral to these centers by physician stockholders. This was addressed superficially by Congress, but in the final version of the bill on self-referral, diagnostic imaging was excluded. The final bill dealt primarily with clinical laboratories.

Q Is self-referral by radiologists for diagnostic imaging a major concern of radiologists?

A Yes, I think that it is. We've never had any hard data that self-referral by physicians led to overutilization. However, in December 1990, Dr. Bruce Hillman, of University of Arizona, in a paper in the New England Journal, studied the clinical settings of pregnancy, upper respiratory infection, urinary tract infection in males, and low back pain. The diagnostic studies he reviewed were ultrasound for pregnancy, chest x-ray for URI, lumbosacral spine films for back pain, and IVP or bladder ultrasound for UTI. He had about 66,000 patient visits from a company that handles the claims for the employees of several large corporations. He found that self-referring physicians ordered 4.4 to 4.7 times as many procedures at 4.5 to 7 times the cost as compared to physicians who referred patients to radiologists for these particular imaging studies.

This study doesn't determine if this increased level of utilization is appropriate—that's the next step. Now Dr. Hillman is doing a similar study with the United Mine Workers. If the results are the same then the United Mine Workers are planning to ban self-referral and see if it has an effect on the quality of care.

Q I would think that the risk of litigation for inaccurate interpretation might constrain nonradiologists from reading x-rays. What are the commonest reasons for malpractice claims in radiology?

A Missed fractures is number one; missed diagnosis of cancer is number two. Now that we are doing more screening mamograms it's predicted that there are going to be a lot more malpractice suits. Most of the missed diagnosis suits related to breast cancer that you see now are because they were mishandled clinically. I think we may see malpractice suits against primary physicians who don't send their patients for routine mamograms.

Q Why don't we have imaging centers in Massachusetts?

A There are two reasons for that. One has to do with the determination of need or DON process required by the state. DON is no longer in effect for CT; but it's still in effect for MRI, lithotripters, cardiac catheterization units and high energy radiation oncology units. The other reason is that Blue Cross/Blue Shield has never paid for the technical cost of CT, ultrasound, or nuclear medicine in the nonhospital setting. They just pay for the interpretation, They are re-looking at this issue now with input from the Massachusetts Radiological Society, as well as several other specialty societies and are considering paying some sort of global fee.

Q Do you think Medicare might go to a diagnostic DRG in both the hospital and non hospital setting, and, if so, what effect might this have?

A Yes, I think that's a real possibility. They are already talking about DRG's for hospital outpatients. Medicare could tell hospitals and physicians that for a given diagnosis such as a herniated disc, they will pay only a set amount for the technical costs and a set amount for the professional interpretation, no matter where the exam is done. Radiologists are going to be put in a difficult position because we don't order these procedures, they are

referred to us. Third parties are trying to put radiologists in the gatekeeper role. I think that's totally inappropriate to take that prerogative away from the patient's own physician who generally knows much more about the patient. It's a direct interference in the doctor-patient relationship.

Q Well, don't you think that the radiologists need to review the ordering of certain studies, say mammograms in very young women?

A Yes I do, and I do see an increased role for the radiologist as a consultant. We have such a menu of studies to choose from now. Physicians frequently call us and say, "What should I do first?" But it's one thing for the radiologist to give advice to the referring physician and quite another for the radiologist to be expected to overrule the referring physician. Third parties seem to have the misperception that a substantial number of radiological procedures, as well as surgical procedures are not indicated. The vast majority are indicated. ■

Brigid K. Glackin, M.D.

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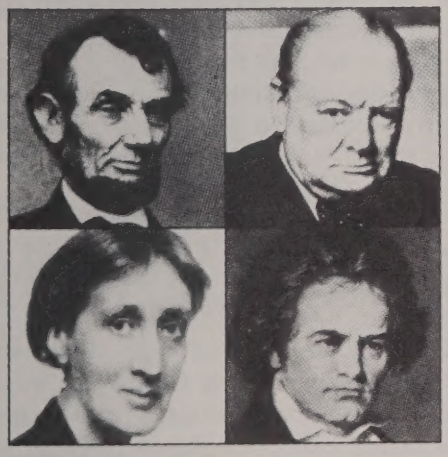

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In Memoriam

Robert A. Kelley, M.D., practiced urology in the Springfield area for 44 years. He was a graduate of the University of Rochester School of Medicine, and trained at Johns Hopkins University. He served in the U.S. Navy. He leaves his wife, Mary, a son, Dr. David R. Kelley, and two daughters, Peggy A. Doyle and Maureen E. Doyle.

Edwin J. Gillis, M.D., practiced surgery in Westfield. He gained his medical degree from Tufts University School of Medicine, and trained in medicine and Surgery at St. Vincent's Hospital in New York City. He was former chief-of-staff at Noble Hospital. He leaves his wife, Mary, three sons, Thomas, Mark, and Edwin; and two daughters, Anne Gillis and Melinda Morgan.

Harry L. Strachan, Jr., M.D., practiced anesthesiology in the Springfield area. He graduated from Harvard Medical School, and trained at Springfield and Wesson Maternity hospitals, then trained in anesthesiology at Columbia University and Bellevue Hospital in New York City. He was former chief of Anesthesiology at Baystate Medical Center. He served in the Army Medical Corps. He leaves his wife, Jasmine, and two sons, Harry and William.

William M. Gregory, M.D., practiced medicine in Chicopee. He was a graduate of Tufts University School of Medicine, and trained at Mercy Hospital in Springfield. He served in the Army Medical Corps. He was a doctor for the Chicopee schools, and former president of the Chicopee Board of Health. He was a former president of Our Lady of Providence Home for Children. He leaves his wife, Anna, two sons, William and John, and three daughters, Anne E. Gregory, Carol A. Moschetto, and Mary A. Gregory.

John W. Turner, M.D., practiced radiology in Springfield, a reflection on his life and contributions appears elsewhere in this issue. ■

New Members Welcome

Lucy A. Bayer-Zwirello, M.D.
Baystate Medical Center
759 Chestnut Street
Springfield, MA 01199

Born: December 3, 1951
Premed: University of Montreal 1970-1973
Medical: Catholic University of Louvain, Belgium 1974-1981
Internship: Sherbrooke University Medical Center, Canada 1981-1982
Residency: Sherbrooke University Medical Center 1982-1986
Fellowship: University of California/San Diego Medical Center 1986-1988
Specialty: Obstetrics/Gynecology/Perinatology

Keith M. Boyd, M.D.
Baystate Medical Center
759 Chestnut Street
Springfield, MA 01199

Born: December 27, 1960
Premed: Amherst College 1979-1983, Boston College 1984-1986
Medical: University of Illinois at Chicago 1986-1990
Internship: Baystate Medical Center 1990-Present
Specialty: Internal Medicine/Pediatrics
Resident

Dennis R. Pannullo, M.D.
444 Montgomery Street
Chicopee, MA 01020

Born: January 22, 1952
Premed: Kenyon College, Ohio 1970-1974
Medical: Universidad Autonoma de Guadalajara 1975-1978 University of Nebraska 1978-1980
Internship: University of Massachusetts Medical School 1980-1981
Residency: University of Massachusetts Medical School 1981-1983
Specialty: Internal Medicine

Ricardo G. Gutierrez, M.D.
2 Medical Center Drive Suite 512
Springfield, MA 01107

Born: April 22, 1951
Premed: Rosario University
Medical: Rosario University 1974
Internship: West Virginia University 1976-1977
Residency: West Virginia University 1977-1978
St. Vincents's Medical Center, New York 1978-1980
Specialty: Obstetrics/Gynecology

Stephen V. Klein, M.D.
Mercy Hospital Dept. of Radiology
271 Carew Street
Springfield, MA 01104

Born: May 13, 1955
Premed: The City College of New York 1971-1976
Medical: Yeshiva University-Albert Einstein College of Medicine 1979-1983
Internship: Albany Medical Center Hospital 1983-1984
Residency: Albany Medical Center Hospital 1984-1988
Fellowship: Thomas Jefferson University Hospital 1988-1989
Specialty: Diagnostic Radiology

Susan J. Holland, M.D.
305 Bicentennial Highway
Springfield, MA 01118

Born: September 29, 1959
Premed: University of Maryland College Park 1977-1981
Medical: University of Maryland Medical School 1981-1985
Internship: University of California-Davis Medical Center 1985-1986
Residency: University of California-Davis Medical Center 1986-1988
Specialty: Internal Medicine

Continued on next page

New Members Welcome

Continued from previous page

David S. Tamaren, M.D.
444 Montgomery Street
Chicopee, MA 01020

Born: December 1, 1944
Premed: University of Connecticut 1963-1967
M.I.T. of Northeastern University 1967-1971
Medical: Albert Einstein College of Medicine 1971-1974
Internship: Hartford Hospital 1974-1975
Residency: Hartford Hospital 1975-1977
Beth Israel Hospital 1978-1981
Specialty: Radiology/Internal Medicine

Vickie J. Verlinden, M.D.
305 Bicentennial Highway
Springfield, MA 01118

Born: August 31, 1953
Premed: Wayne State College, Indiana 1975
Medical: Kansas University Medical Center 1981-1985
Internship: University of Nebraska 1985-1986
Residency: University of Nebraska 1986-1988
Specialty: Internal Medicine

Lawrence L. Ward, M.D.
Massachusetts Mutual Insurance Co.
1295 State Street
Springfield, MA 01111

Born: May 29, 1951
Premed: University of Arizona 1969-1972
Medical: Georgetown University Medical School 1972-1976
Internship: Chestnut Hill Hospital, Pennsylvania 1976-1977
Residency: Chestnut Hill Hospital, Pennsylvania 1977-1979
Specialty: Administrative Medicine/Emergency Medicine/Family Medicine

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